

WHAT IS CLAIMED IS:

- 1 1. An apparatus for temperature compensation of a region of an optical fiber, wherein the
2 apparatus comprises
 - 3 (a) a first member having a positive coefficient of thermal expansion, wherein at least a
4 portion of the first member lies in a first plane;
 - 5 (b) a second member on the first member, wherein the second member has a coefficient
6 of thermal expansion lower than the coefficient of thermal expansion of the first
7 member, and
 - 8 (c) a mount for the optical fiber, wherein the mount is substantially normal to the first
9 plane and extends a predetermined distance from the first plane.
- 1 2. The apparatus of claim 1, wherein the mount comprises a first tower and a second tower.
- 1 3. The apparatus of claim 2, wherein the first and second towers comprise a mounting
2 surface for the optical fiber, wherein the mounting surfaces of the first and second towers
3 are substantially planar.
- 1 4. The apparatus of claim 3, wherein the mounting surfaces of the first and second towers
2 are substantially the same distance from the first plane.
- 1 5. The apparatus of claim 3, wherein the mounting surface of at least one of the first and
2 second towers comprises a latch to retain the optical fiber.
- 1 6. The apparatus of claim 3, wherein the mounting surface of at least one of the first and
2 second towers is metallized.
- 1 7. The apparatus of claim 3, wherein at least one of the first and second towers comprises a
2 notch to retain the optical fiber.
- 1 8. The apparatus of claim 7, wherein the notch is elongated and extends longitudinally along
2 the mounting tower and in a direction substantially normal to the first plane.
- 1 9. The apparatus of claim 3, wherein the coefficient of thermal expansion of the first
2 member, the coefficient of thermal expansion of the second member, and the

3 predetermined distance of the mounting surfaces above the first plane are selected to
4 apply a compressive axial strain to the region with increasing temperature and a tensile
5 axial strain to the region with decreasing temperature.

- 1 10. The apparatus of claim 2, wherein the first member comprises a first metal and the
2 second member comprises a second metal different from the first metal.
- 1 11. The apparatus of claim 10, wherein at least one of the towers comprises the second metal.
- 1 12. A method for temperature compensating a region of an optical fiber with a diffraction
2 grating, comprising:
3 (a) providing a temperature compensation apparatus comprising
4 (1) a first member having a positive coefficient of thermal expansion, wherein at
5 least a portion of the first member lies in a first plane;
6 (2) a second member on the first member, wherein the second member has a
7 coefficient of thermal expansion lower than the coefficient of thermal
8 expansion of the first member; and
9 (3) a mount for the optical fiber, wherein the mount comprises a first tower and a
10 second tower, and wherein the towers are substantially normal to the first plane
11 and extend a predetermined distance from the first plane; and
12 (b) attaching the optical fiber to the first and second towers such that the region lies
13 therebetween.
- 1 13. The method of claim 12, wherein in step (b) the optical fiber is attached with an adhesive
2 to at least one of the first and second towers.
- 1 14. The method of claim 12, wherein step (b) comprises metallizing the optical fiber and
2 soldering the optical fiber to at least one of the first and second towers.
- 1 15. The method of claim 12, wherein at least one of the first and second towers comprises a
2 latch, and the optical fiber is attached to the tower with the latch.
- 1 16. The method of claim 12, wherein step (b) is performed with the optical fiber under
2 tension.

1 17. A temperature compensating package for a fiber optic Bragg grating, comprising an
2 enclosure with a first end and a second end, an optical fiber mount on a first end of the
3 enclosure, and a temperature compensating washer on the second end of the enclosure,
4 wherein the washer comprises a disk with an aperture, wherein the disk comprises a first
5 layer adjacent the second end of the enclosure and a second layer on the first layer,
6 wherein the first layer has a positive coefficient of thermal expansion and the second
7 layer with a coefficient of thermal expansion lower than the coefficient of thermal
8 expansion of the first layer.

1 18. A temperature compensating optical device, comprising:
2 (a) a first member having a positive coefficient of thermal expansion, wherein at least a
3 portion of the first member lies in a first plane;
4 (b) a second member on the first member, wherein the second member has a coefficient
5 of thermal expansion lower than the coefficient of thermal expansion of the first
6 member;
7 (c) a mount for the optical fiber, wherein the mount comprises a first tower and a
8 second tower, wherein the first and second towers are substantially normal to the
9 first plane and extend a predetermined distance from the first plane; and
10 (d) an optical fiber attached to the first and second towers, wherein a region between
11 the first and second towers comprises a diffraction grating.

1 19. A temperature compensating optical device, comprising:
2 (a) an enclosure with a first end and a second end,
3 (b) an optical fiber mount on a first end of the enclosure,
4 (c) a temperature compensating washer on the second end of the disclosure, wherein
5 the washer comprises a disk with an aperture, wherein the disk comprises a first
6 layer adjacent the second end of the enclosure and a second layer on the first layer,
7 wherein the first layer has a positive coefficient of thermal expansion and the second
8 layer with a coefficient of thermal expansion lower than the coefficient of thermal
9 expansion of the first layer; and

- 10 (d) an optical fiber attached to the fiber mount and the washer, wherein a region of the
11 optical fiber is within the enclosure, and wherein the region comprises a diffraction
12 grating.

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